

Calculus Warm Up #13-1

1. Find $\frac{dy}{dx}$: $y = \sqrt[4]{x^3}(x-1)$

2. Find $\frac{d^2y}{dx^2}$: $y = \frac{x-4}{x+1}$

3. Find y' : $y^3 - 3xy = x^2$

Find all points of horizontal and/or vertical tangency.

1. $x = t + 1$
 $y = t^2 + 3t$

2. $x = 4 \cos^2 \theta$
 $y = 2 \sin \theta$

(x, y)
Find all points of horizontal and/or vertical tangency.

1. $x = t + 1 \rightarrow x = -\frac{3}{2} + \frac{2}{2}$ 2. $x = 4 \cos^2 \theta$
 $y = t^2 + 3t \rightarrow y = \frac{9}{4} + \left(\frac{-3}{2}\right) \cdot \frac{2}{2}$ $y = 2 \sin \theta$

$$\frac{dy}{dx} = \frac{2t+3}{1} \leftarrow \neq 0$$

$$\frac{dy}{dx} = 2t + 3 \quad \text{No vertical tangent}$$

$$0 = 2t + 3$$

$$t = -\frac{3}{2}$$

$$\left(-\frac{1}{2}, -\frac{9}{4}\right)$$

point of tangency where the tangent is horizontal.

$$\frac{dy}{dx} = \frac{2 \cos \theta}{-8 \cos \theta (\sin \theta)}$$

$$= -\frac{1}{4 \sin \theta}$$

$$\frac{4 \sin \theta}{4} = 0$$

$$\sin \theta = 0$$

$$\theta = \pi n$$

$$x = 4 [\cos(\pi n)]^2$$

$$= 4(\pm 1)^2$$

$$x = 4 \quad y = 2 \sin(\pi n)$$

$$2(0)$$

$$= 0$$

point of tangency (4, 0)
on a vertical tangent

Check answers and work on:

Final Exam Rev. 1 & 2

AP Rev. # 9

HW: AP Review #10